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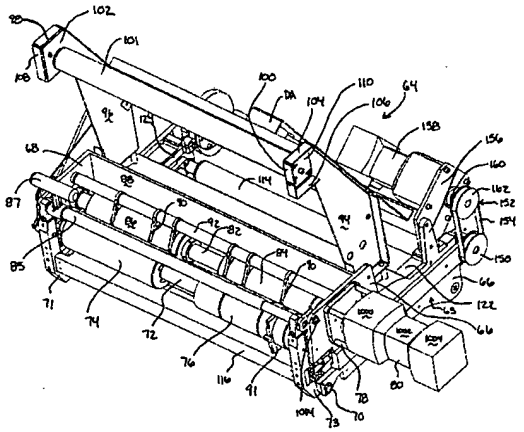
(54) Title: FOAM-IN-BAG DISPENSING SYSTEM ASSEMBLY WITH FILM FEED AND BAG FORMATION SYSTEM



(57) Abstract: A film feeding system having use in a foam-in-bag dispensing system which includes a hinged front access assembly providing ready access to nip roller sets, end and cross cut sealing wires, film diversion prevention canes, etc. to facilitate rapid service and replacement. The film is fed from a source which is in driving engagement with a torque motor and travels over a smooth configured dispenser housing before being end and edge sealed. The smooth body dispenser housing encompasses a mixing module reciprocating cartridge and a valve rod driving system. The film is fed to a roller assembly as in a nip roller set which is driven by a drive motor with its own monitor. A controller communicating with the nip roller motor and the film source motor is utilized to maintain desired film tension and also provide for adjustment and determination of potential or active film fed problems as well as film supply level monitoring. The edge seal formation is achieved with an edge seal device having an adjustable/controllable heater cartridge supported at a bearing sleeve receiving a shaft of a nip roller set lying between moving edge seal support rollers in driving engagement with the shaft. A cross-cut and/or seal is formed with a controlled movable jaw and fixed jaw combination with the moving jaw having a compliance system for absorbing misalignment.

WO 2004/101252 A2

What is Claimed:

1. A foam-in bag dispensing system, comprising:

a dispenser with chemical output port;

a film feed assembly which feeds film to said dispenser for receiving chemical output from said dispenser, said film feed assembly including a film drive roller set which comprises a first roller and a second roller rotating on non-coincident axes, and a support structure which supports said film drive roller set, said support structure including a first frame structure and a second frame structure with said first frame structure supporting said first roller and being adjustable relative to said second frame structure so as to move said first roller away from said second roller.

2. The system of claim 1 wherein said second frame structure receives said second roller.

3. The system of claim 2 wherein said first frame structure is adjustable between a drive mode wherein said first and second rollers are in a film drive nip relationship and an access mode wherein said first and second rollers are free of contact.

4. The system of claim 1 wherein said second frame structure is a stationary frame structure relative to said first frame structure when said first frame structure is adjusted.

5. The system of claim 1 wherein said first frame structure is pivotably supported by said second frame structure.

6. The system of claim 5 wherein said first frame structure is pivotably supported at a lower end and has an upper section which rotates out away from said second frame structure.

7. The system of claim 5 further comprising a latch mechanism which latches said first and second frame structures together to place said first and second rollers in a film drive mode.

8. The system of claim 7 wherein said latch mechanism includes a handle member secured to a latch bar with first and second latch members spaced apart along said latch bar.

9. The system of claim 8 wherein said latch members are cam latches having hook sections.

10. The system of claim 1 further comprising a roller drive motor and wherein said second roller is in a driving relationship with said drive motor, and wherein said first roller is pivotably supported by said first frame structure and is driven by way of rotation in said second roller.

11. The system of claim 1 wherein said second frame structure includes a pair of support extensions between which said second roller extends and said second roller having shaft ends received by said support extensions.

12. The system of claim 1 wherein said first frame structure includes first and second sub-frame sections and an interconnecting intermediate bar, and said first and second sub-frame sections each having a bearing support receiving respective shaft ends of said first roller.

13. The system of claim 12 wherein said bearing supports are releasably fastened to said sub-frame sections.

14. The system of claim 12 wherein said intermediate bar includes a heater wire extension surface.

15. The system of claim 14 further comprising a heater wire extending along said heater wire extension surface.

16. The system of claim 15 wherein said heater wire includes opposite end connector pins which are releasably received by connector pin reception holders supported by said intermediate bar.

17. The system of claim 15 further comprising a pair of seal wires extending parallel to said heater wire, and wherein said heater wire provides film cutting means and is positioned between said seal wires, and said heater and seal wires have conductor pins which are releasably received by conductor reception holders supported by said intermediate bar.

18. The system of claim 1 further comprising first frame structure movement limiting means.

19. The system of claim 18 wherein said first frame structure movement limiting means includes a pair of negator springs which preclude unrestricted movement of said first frame structure in moving from a film feed position to an access position.

20. The system of claim 1 further comprising an edge seal which is supported by said first frame structure so as to be more easily accessible upon said first frame structure moving from a film feed mode to an access mode wherein said first roller is spaced sufficiently apart from said second roller for edge seal removal.

21. The system of claim 20 wherein said edge seal includes a base support structure through which said roller shaft extends.

22. The system of claim 1 further comprising a plurality of film canes spaced along said second roller which are partially covered when said first frame structure and supported first roller is in a film feed mode and less covered so as to be accessible when said first frame structure and first roller are adjusted into an access mode wherein said first roller is separated from said second roller to provide greater access to said canes.

23. The system of claim 1 wherein said film drive roller set comprises only said first and second rollers which are in a state of compression in film feed mode, and wherein said first and second rollers each include a sub-roller set having sub-rollers spaced along respective roller shafts, and said dispenser is arranged to dispense foam within a gap defined by said spaced apart sub-rollers on said respective roller shafts.

24. A dispensing system, comprising:

a foam precursor chemical dispenser;

a film feed assembly adapted to feed film to said dispenser;

a first support structure and a second support structure, said first support structure being adjustable between a closed mode and an access mode relative to said second support structure, and film cut means for use in forming bags from the film;

said film cut means being supported by said first support structure so as to be adjustable between a less accessible location to a more accessible location upon adjustment of said first support structure from said film feed mode to the access mode.

25. The system of claim 24 wherein said film cut means includes a heater wire and a heater wire support, said heater wire support including a first heater-jaw and said first support structure including a pair of sub-frame sections which are connected with said first heater-jaw.

26. The system of claim 25 wherein said first and second sub-frame sections of said first support structure are pivotably connected at a lower region to said second support structure.

27. The system of claim 25 further comprising a second heater-jaw and means for moving said second heater-jaw between a film contact with said film cut means position and a retracted position, and said first heater-jaw being stationary relative to said second heater-jaw when said first support structure is in the closed mode.

28. The system of claim 24 wherein said film feed assembly includes a drive roller supported by said second support structure, a motor in driving engagement with said drive roller and a driven roller supported on said first support structure and adjustable between a film feed mode when said first support structure is in the closed mode and an access mode wherein said driven roller is separated from said drive roller upon said first frame structure assuming said access mode.

29. The system of claim 24 further comprising a bag edge sealer supported on said first support structure so as to be adjustable between an edge seal formation position when said first frame structure is in said closed mode and is accessible for servicing when said first frame structure assumes said access mode.

30. The system of claim 24 further comprising an end seal which is supported by said first support structure and includes a heater wire that extends in a common direction with a heater wire of said film cut means.

31. The system of claim 30 wherein said heater wires of said end seal and film cut means include conductive connector pins and said first support structure includes connector pin reception means for releasably receiving said connecter pins of said seal and cut means.

32. A method of servicing a foam-in-bag dispenser system comprising:

moving a first frame structure relative to a second frame structure between a closed position to an open access position, with said first frame structure supporting a component of a film feed assembly.

33. The method of claim 32 further comprising unlatching a latch assembly which maintains said first and second frame structures in the closed mode and, following unlatching, moving said first frame structure away from said second frame structure.

34. The method of claim 33 further comprising limiting freedom of movement in said first frame structure by means for limiting movement.

35. The method of claim 33 wherein movement of said first frame structure includes a pivoting of said first frame structure away from said second frame structure.

36. The method of claim 33 wherein movement of said first frame structure includes movement of a film edge sealer supported by said first frame structure from an edge seal mode to an access mode wherein said edge sealer is releasable within a space being opened up upon said movement of said first frame structure.

37. The method of claim 32 further comprising inserting film material between a pair of roller sets while said system is in the open access position and driving said film with said roller set while in the closed position.

38. A method of servicing a foam-in-bag dispenser system, comprising:

moving a first heater-jaw between a retracted position and a film bag formation cut position relative to a second heater-jaw; and moving a first frame structure between a closed position to an open access position, said first frame structure supporting said second heater-jaw and said second heater-jaw supporting a film cutter which is more readily accessible for servicing when said first frame structure is in said open access position.

39. The method of claim 38 wherein said film cutter is a heater wire with pin connectors at opposite ends and said second heater-jaw having pin reception ports which releasably receive said pin connectors.

40. The method of claim 38 wherein movement of said first heater-jaw includes a drive motor and cam members in driving contact with heater-jaw support shafts extending between said cam members and said first heater-jaw.

41. A foam-in bag dispensing system, comprising:

a dispenser with chemical output port;

a film feed assembly which feeds film to said dispenser for contact with chemical output from said dispenser, said film feed assembly including a first film feed member and a

second film feed member which together draw film from a film source and a film feed assembly support structure comprising first and second frame structures with said first frame structure supporting said first film feed member and being adjustable relative to said second frame structure so as to move said first film feed member away from said second film feed member.

42. A film supply apparatus for a foam-in-bag dispenser system, comprising:

a support member;

a spindle supported by said support member, said spindle having a support extension for receiving a roll of film for use;

and a spindle-to-support connector, with said spindle-to-support connector supporting said spindle for adjustment of said spindle between a film feed to dispenser mode position and a film roll replacement position different than said film feed to dispenser mode position.

43. The film supply apparatus of claim 42, wherein said spindle-to-support connector includes a hinge which provides for rotation of said spindle between said film feed to dispenser mode position and said film roll replacement position.

44. The film supply apparatus of claim 42 wherein said spindle is arranged along a longitudinal axis coinciding with an axis of roll rotation during feed out of film, and wherein said film roll replacement position falls on an axis which is 60 to 120° away from said longitudinal axis.

45. The film supply apparatus of claim 42 further comprising a roll retention latch provided at a free end of said spindle.

46. The film supply apparatus of claim 45 wherein said roll retention latch includes a handle member which is adjustable between a first position where the roll is axially slideable off said spindle and a latch position wherein said roll is precluded from axial sliding off of said spindle.

47. The film supply apparatus of claim 42 wherein said support extension is adjustable in axial length for accommodating different axial length film rolls.

48. The film supply apparatus of claim 42 further comprising a latch for fixing said spindle in said film feed to dispenser mode position, said latch including a latch component which is positioned for deflecting contact with a latch reception component supported by said spindle such that a rotation of said spindle from said film roll replacement position to said film feed to dispenser mode position automatically moves said latch into a latch state following deflection.

49. The film supply apparatus of claim 48 wherein said latch further comprises a release facilitator which includes means for pushing said spindle out from said film feed to dispenser mode position toward said film roll replacement position.

50. The film supply apparatus of claim 42 wherein said spindle has two axially spaced film roll mounting surfaces of different diameter, with an interior one being larger in diameter than a more outer one of said mounting surface which mounting surfaces are dimensioned relative to core inserts of the film roll which core inserts are dimensioned of different sizes so as to limit mounting of the film roll in only one axial orientation.

51. A film supply apparatus for use in a foam-in-bag dispenser, comprising:

a film source support for supporting a film source;

a film source driver;

a film source drive transmission in driving communication with said film source driver;

a film feed roller assembly positioned downstream with respect to film travel to said film source support,

a film feed driver in driving communication with said film feed roller assembly;

said film source drive transmission being in driving communication with said film source supported on said film source support to provide film web tensioning in the film being drawn by said film feed roller assembly.

52. The film supply apparatus of claim 51 wherein said film source support includes a spindle for receiving a roll of film and said film source drive transmission including a film source engagement member supported on said spindle.

53. The film supply apparatus of claim 52 wherein said film source engagement member includes a plurality of projections for engagement with a core insert of the film roll while supported on said spindle.

54. The film supply apparatus of claim 53 wherein said engagement member includes an annular ring having a plurality of circumferentially spaced projections separated by clearance areas.

55. The film supply apparatus of claim 54 further comprising a film roll with film core having a drive transmission core insert, said core insert comprising an annular ring with a plurality of projections and clearance spaces therebetween which are arranged for rotational driving transmission upon meshing with said annular ring of said engagement member.

56. The film supply apparatus of claim 55 wherein said film roll includes a non-drive core insert which is positioned at an opposite end of said film core and is in supporting contact with said spindle.

57. The film supply apparatus of claim 54 wherein said projections include tapered first contact extensions and base sections of greater thickness and having side walls for imparting rotational driving transmission to said film roll.

58. The film supply apparatus of claim 52 wherein said spindle is adjustable in length to accommodate different length roll cores.

59. The film supply apparatus of claim 51 further comprising a controller which is in communication with said film source driver.

60. The film supply apparatus of claim 59 wherein said controller is also in communication with said film feed driver.

61. The film supply apparatus of claim 60 wherein said controller includes means for moving said film in a reverse direction opposite a direction of film feed induced by said feed roller assembly.

62. The film supply apparatus of claim 61 wherein said controller includes means for inducing tension in said film during idle periods wherein said film feed roller set is not operating.

63. The film supply apparatus of claim 59 wherein said film source includes a film roll support for supporting a film roll and the controller determines film roll diameter by comparing film feed velocity to angular velocity of the film roll while unwinding.

64. The film supply apparatus of claim 59 wherein said controller includes means for decreasing the level of torque upon an initiation or start up of film feed by said film feed roller assembly.

65. The film supply apparatus of claim 59 wherein said controller includes means for increasing the level of torque upon said film feed roller assembly discontinuing film feed drive.

66. The film supply apparatus of claim 59 wherein said controller includes means for monitoring an amount of film left on said roll and increases torque levels upon determining lowered amounts of film remaining on said film roll.

67. The film supply apparatus of claim 59 wherein said controller includes means for monitoring film status which includes means for generating a system shut down signal upon

determination of a speed increase in said film source driver due to a removal of torque resistance upon film run out.

68. The film supply apparatus of claim 19 wherein said controller includes means for monitoring film status which includes means for generating a system shut down upon determination of a film jam based on a relationship determination of said feed roller assembly continuing movement but said film feed source driver sensing film tension levels deviating from a normal range of feed roller draw tensioning in the film.

69. The film supply apparatus of claim 51 wherein said film feed driver includes an encoder and said film source driver includes an encoder, and said controller includes means for determining film roll diameter from data provided by said encoders.

70. The film supply apparatus of claim 51 wherein film is passed by a foam dispensing unit located downstream with respect to film travel direction from the film source and upstream of said film feed roller set.

71. The film supply apparatus of claim 70 wherein the film is a C-fold film and wherein said dispenser is arranged with respect to film feed travel such that a C-fold edge travels outward of a forward end of said dispenser and said feed roller set includes an edge sealer which joins free edge portions of the C-fold film following travel of said free edge portions along opposite side walls of said dispenser.

72. The film supply apparatus of claim 50 wherein said film source driver is arranged to move film backwards or in a direction opposite to a direction of film feed induced by said film feed roller assembly.

73. The film supply apparatus of claim 50 further comprising an idler roller over which the film travels in going between said film source support and said film feed roller assembly, and said film supply apparatus further comprising film web tracking adjustment

means which alters said idler roller orientation to have said film properly track in traveling through a pinching film feed roller set of said film feed roller assembly.

74. A film supply apparatus for supplying film in a foam-in-bag system, comprising:

film feeding means for feeding film from a film source to a location for bag formation;

a bag forming apparatus;

a foam material dispenser positioned for feeding foam material for reception in a bag of said bag forming apparatus;

a web tensioning system having a web tensioning driver in driving communication with the film source;

a controller for monitoring the film feed and web tension states and directing adjustments in said web tension system.

75. The film supply apparatus of claim 74 wherein said web tensioning driver is arranged to move film backwards or in a direction opposite to a direction of film feed induced by said film feeding means.

76. The film supply apparatus of claim 74 wherein the film source includes a roll of film and said web tensioning system includes a drive transmission in communication with the roll of film for rotational driving of the roll of film and also in communication with said web tensioning driver.

77. The film supply apparatus of claim 76 further comprising a spindle support for supporting the roll of film and wherein said drive transmission includes a spindle drive having a plurality of projections for engagement with a core insert of the film roll supported on said spindle.

78. The film supply apparatus of claim 77 wherein said spindle drive includes an annular ring having a plurality of circumferentially spaced projections separated by clearance areas.

79. The film supply apparatus of claim 78 further comprising a film roll with a roll drive insert secured at an end of said roll and which is dimensioned for meshing rotation drive engagement with said spindle drive.

80. The film supply apparatus of claim 79 wherein said roll drive insert comprises an annular ring with a plurality of projections and clearance spaces therebetween which are arranged for rotational driving transmission upon meshing with said spindle drive.

81. A method of supplying film to a foam-in-bag dispenser comprising:

feeding with film feeding means film from a film source past a foam dispenser;

maintaining a tension state in the film being fed by the film feeding means with a web tension system which is in driving engagement with the film source by way of a drive transmission connection to the film source.

82. The method of claim 81 further comprising monitoring a state of web tension with a controller which receives input data from both said film feeding means and said web tension system.

83. The method of claim 81 further comprising shutting down said film feeding means upon a sensed film run out based on a comparison of data input from said film feeding means and said web tensioning system.

84. The method of claim 83 wherein said film source is a roll of film on a core and said web tension system includes a drive engagement member that meshes in rotational drive transmission fashion with said core.

85. A film roll core insert for use in a web tension system of a foam-in-bag system, comprising a ring dimensioned for securement within a core end of a film roll and having

rotation drive meshing means for rotational drive engagement with a driver of the web tension system.

86. A foam-in-bag dispenser system, comprising:

a film supply support;

a film feeding device for drawing film from a film source supported on said film supply support;

a dispenser having a foam material outlet;

a bag forming apparatus which forms bags for receiving the foam material output of the dispenser, and wherein

said dispenser comprises a mixing module which receives a foam precursor chemical and a dispenser housing which internally receives said mixing module and is in contact with film being drawn past said housing by said film feeding device, and said housing being dimensioned as to present a smooth contact surface over all areas of film contact with said housing.

87. The system of claim 86 wherein said housing includes a curved upper edge and two planar side surfaces extending down from respective opposite ends of said curved upper edge.

88. The system of claim 87 further comprising a dispenser housing support which supports said dispenser housing so as to have a fixed interior end and a free outward end, with said planar side surfaces representing front and back surfaces, and wherein said film feeding device feeds front and back film sheet sections into contact with respective front and rear planar side surfaces.

89. The system of claim 86 wherein said film feeding device includes a source of C-fold film and feeds said C-fold film past said housing with a fold edge of said C-fold film positioned even further outward of said outward end of said dispenser housing and with the

opposite non-joined edges being located a distance outward of the interior end of said housing.

90. The system of claim 89 wherein said film feeding device includes a nip roller set which receives film following passage downstream with respect to film feed travel of said housing and places in contact the non-joined edges for edge sealing purposes.

91. The system of claim 86 wherein said mixing module includes a reciprocating rod in a chemical outlet passage of said mixing module and said housing supports drive components of a drive transmission which is engaged with said rod for reciprocation within said mixing module.

92. The system of claim 91 wherein said drive transmission includes a sliding crank mechanism covered by said dispenser housing.

93. The system of claim 91 further comprising a motor in driving engagement with said drive transmission with said motor being positioned external to said housing.

94. The system of claim 86 wherein said housing includes a main housing portion which has outer walls representing a majority of the planar surface area in contact with the film being fed past said housing and is an extruded component.

95. The system as recited in claim 1 wherein said dispenser housing includes a free end housing section with said mixing module being mounted at said free end housing section and said free end housing section having an access door which is adjustable between a closed, mixing module cover mode and an open mixing module access mode.

96. The system as recited in claim 95 wherein said access door is pivotably mounted for rotation between said cover mode and said access mode.

97. The system as recited in claim 96 wherein said free end housing section includes a fixed surface to which is connected a door closure and mixing module seal compression

device which is adjustably mounted for movement between a compression on access door state and a non-compression on access door state.

98. The system as recited in claim 97 wherein said door closure and mixing module seal compression device comprises an over center toggle clamp.

99. The system as recited in claim 98 wherein said overcenter toggle clamp includes means for adjusting full toggle closure compression level on said door.

100. The system as recited in claim 95 wherein said housing and mixing module include male/female position mount means for positioning said mixing module in a proper location prior to door closure covering.

101. The system as recited in claim 86 further comprising a chemical inlet manifold and a dispenser housing support which supports said dispenser housing so as to have a fixed interior end and a free outward end, and wherein said fixed interior end is in chemical flow communication with said inlet manifold and said housing has first and second chemical passageways formed therein and extending from said inlet manifold to outlet port holes positioned for fluid communication with inlet ports formed in said mixing module when supported in said housing.

102. The system as recited in claim 101 wherein said mixing module has inlet port projections which are sized for retention of seals which stay fixed to said mixing module and form a sealing relationship with the outlet ports of said chemical passageways formed in said housing.

103. The system as recited in claim 102 further comprising a solvent passage hole in said manifold and a solvent passageway in said dispenser housing having a solvent outlet

port positioned for solvent feed to said solvent passage hole of said mixing module when mounted on said dispenser housing.

104. The system as recited in claim 103 further comprising a heater reception passageway formed in said dispenser housing and positioned within two inches of each of said dispenser housing chemical and solvent passageways.

105. The system as recited in claim 104 further comprising an inlet manifold heater positioned in said inlet manifold.

106. The system as recited in claim 101 further comprising manifold flow shut off valves, pressure transducers for a monitoring pressure levels of chemical being fed to said dispenser housing and filter units supported by said inlet manifold and said dispenser housing encompassing a portion of a drive system for reciprocating the end rod of said mixing module and said drive system including a drive motor, and wherein each of said shut off valves, drive motor, filter units, and transducers are spaced a distance inwardly away, in a direction of elongation of the housing, from an interior edge of the film being fed past said housing so as to avoid foam contact therewith.

107. The system as recited in claim 101 further comprising a heater reception passageway formed in said dispenser housing and positioned within two inches of each of said dispenser housing chemical passageways.

108. A dispenser system comprising:

a mixing module having a housing within which is positioned a mixing chamber with a rod reception passageway and at least one chemical inlet passage opening into said rod reception passageway, said mixing module further comprising a rod which is received for reciprocation in said rod passageway and has an engagement section;

a dispenser housing which receives said mixing module;

a drive mechanism, said drive mechanism including a motor and a drive transmission in driving communication with both said motor and said rod engagement section, said drive transmission including a crank and slider combination which is housed within said dispenser housing.

109. The dispensing system as recited in claim 108 further comprising a bag forming apparatus which is positioned for receipt of chemical output by said mixing module for containment in said bag once formed.

110. The dispensing system as recited in claim 108 wherein said mixing module rod includes a main body which is free of any annular recessed areas along an axial length extending from a first free end to said mixing module rod engagement section, and wherein said engagement section is an expanded member relative to said main body which extends radial out to a greater extent than said main body at least at a border region between said main body and engagement section.

111. The dispenser system as recited in claim 108 wherein said dispenser housing supports said mixing module and has a mixing module mounting section and a cover positionable over said mixing module upon receipt in said mounting section, and said motor being supported by said dispensing housing at an external location to said dispenser housing and said crank and slider mechanism being supported entirely internally within said dispenser housing.

112. The dispenser system as recited in claim 111 wherein a main shaft extends through an axial passageway in said dispenser housing to an outward end of said dispenser housing and said crank mechanism converts rotation forces of said main shaft to linear reciprocation forces vertically aligned with a verticals mounted mixing module in said dispenser housing.

113. The dispenser system as recited in claim 108 further comprising means for monitoring a location of said mixing module rod within said mixing module.

114. The dispenser system as recited in claim 113 wherein said means for monitoring includes an encoder associated with said motor which is a DC brushless motor and said means for monitoring further comprising a processor for processing position data received by said encoder.

115. The dispenser system as recited in claim 114 further comprising a home position sensor which is in communication with said processor and positioned at a location which monitors a position of either said mixing module rod or a location of an object in said drive transmission.

116. The dispenser system as recited in claim 108 wherein said dispenser housing supports and partly covers is a cleaning brush drive system which is positioned for cleaning engagement with an outlet end of said mixing module.

117. A method of avoiding film wrinkling in a foam-in-bag dispensing system comprising feeding film past a dispenser housing supporting said mixing module which dispenser housing presents only smooth surface portions to film sections passing to opposite sides of said dispenser before coming back into contact in a nip roller feed device in said dispensing system for bag formation.

118. An edge seal assembly for use with a nip roller set, comprising

an edge wire;

an edge wire support;

a bearing sleeve which receives a driving member of the film driving mechanism such that said edge wire support retains an edge seal position while said driving member rotates within the sleeve.

119. The edge seal assembly as recited in claim 118 wherein said edge seal support includes an insert head and a housing receiving said insert head.

120. The edge seal assembly as recited in claim 119 wherein said housing includes a pair of side positioning members between which said insert head is positioned.

121. The edge seal assembly as recited in claim 120 wherein said side positioning members include a pair of shoes releasably secured to said housing.

122. The edge seal assembly as recited in claim 121 wherein said shoes are electrically conductive and said housing is electrically insulating.

123. The edge seal assembly as recited in claim 118 wherein said bearing sleeve includes a friction reducing roller bearing on an interior surface and further includes an intermediate slot dimensioned for receipt of the electrically conductive housing.

124. The edge seal assembly as recited in claim 118 further comprising a first roller member having means for attachment with a rotating roller component of a nip roller set of the film driving mechanism, and said first roller member being free to rotate relative to said sleeve.

125. The edge seal assembly as recited in claim 118 further comprising a second roller member having means for attachment with a rotating roller component of the nip roller set, and said second roller member being free to rotate relative to said sleeve.

126. The edge seal assembly as recited in claim 118 wherein said support includes a base block and a housing member releasable secured to said base block, and said block and housing having a cavity for receiving the driving member of a nip roller set of the film driving mechanism.

127. The edge seal assembly as recited in claim 126 further comprising a pair of electrical conductor extensions and wherein said base block and housing are releasably

119. The edge seal assembly as recited in claim 118 wherein said edge seal support includes an insert head and a housing receiving said insert head.

120. The edge seal assembly as recited in claim 119 wherein said housing includes a pair of side positioning members between which said insert head is positioned.

121. The edge seal assembly as recited in claim 120 wherein said side positioning members include a pair of shoes releasably secured to said housing.

122. The edge seal assembly as recited in claim 121 wherein said shoes are electrically conductive and said housing is electrically insulating.

123. The edge seal assembly as recited in claim 118 wherein said bearing sleeve includes a friction reducing roller bearing on an interior surface and further includes an intermediate slot dimensioned for receipt of the electrically conductive housing.

124. The edge seal assembly as recited in claim 118 further comprising a first roller member having means for attachment with a rotating roller component of a nip roller set of the film driving mechanism, and said first roller member being free to rotate relative to said sleeve.

125. The edge seal assembly as recited in claim 118 further comprising a second roller member having means for attachment with a rotating roller component of the nip roller set, and said second roller member being free to rotate relative to said sleeve.

126. The edge seal assembly as recited in claim 118 wherein said support includes a base block and a housing member releasable secured to said base block, and said block and housing having a cavity for receiving the driving member of a nip roller set of the film driving mechanism.

127. The edge seal assembly as recited in claim 126 further comprising a pair of electrical conductor extensions and wherein said base block and housing are releasably

secured by said electrical conductor extensions extending within each of said housing and base block.

128. The edge seal assembly as recited in claim 127 wherein said housing includes a pair of side positioning members between which said insert head is positioned and said side positioning members include a pair of shoes releasably secured to said housing and said conductor extensions are a pair of conductor pins with each being in electrical communication with a respective one of said shoes.

129. The edge seal assembly as recited in claim 118 further comprising a guide pin which extends into said head insert which head insert is slidingly supported thereon.

130. The edge seal assembly as recited in claim 118 wherein said support includes a housing receiving a pair of releasable shoes formed of a conductive material and said head insert includes an upper wire portion and two conducting side extensions of said upper wire portion which are placed in electrical communication with said shoes.

131. The edge seal assembly as recited in claim 118 further comprising a wire formed of a material with a TCR value which increases by at least .008 ohm per 10 degree rise in temperature between 350 to 425 degrees.

132. An edge seal assembly comprising:

an edge seal support; and

an edge seal wire having a TCR value of .00015 to .00030 ohm/ohm/degree Celsius at 20 degrees Celsius resistivity for a 0 to 100 degrees Celsius and a ohms/CMF of from 350 or more.

133. An edge seal assembly; comprising:

an edge seal heater element;

a sleeve;

an edge seal support fixed to said sleeve and supporting the edge seal heater element;

a roller bearing supported by said sleeve and dimensioned for receipt of a roller shaft of a film driving mechanism.

134. The edge seal as recited in claim 133 wherein said heater element is a resistance wire.

135. The edge seal as recited in claim 133 further comprising a roller which is slidingly received on said sleeve and has means for releasably fixing to a rolling component of the nip roller.

136. An edge seal assembly comprising:

an edge seal heater element;

a support for said edge seal heater element;

a control system in electrical communication with said heater element and said control system including means for comparing resistance levels at a current temperature and comparing with a TCR based or derived value reference.

137. A method of sealing an edge of a bag in a foam-in-bag assembly comprising:

providing an edge sealer which is supported on a moving drive member of a film drive mechanism while retaining a non-rotating edge seal position relative to film being fed past the edge sealer;

heating a heating element of the edge sealer to form an edge seal in a bag of the foam-in-bag assembly.

138. A foam-in-bag assembly; comprising:

a film feed mechanism which feeds film with a film driver;

a bag forming assembly which comprises an edge sealer that contacts film being fed by said film driver and which is supported on a moving member of said film feed mechanism and retains a fixed position relative to said moving member while in sealing engagement with said film being fed by said film driver;

a dispenser for feeding foam forming material to a bag being formed by said bag forming assembly.

139. The foam-in-bag assembly of claim 138 wherein said film feed mechanism includes a pair of nip rollers which receive film therebetween, and wherein said film feed mechanism includes a roller support for one of said rollers that is adjustable between a first position and a second position which is further removed from an opposing one of said nip rollers

140. The foam-in-bag assembly of claim 139 wherein said support is pivotably supported on said film.

141. An end sealer shifting assembly, comprising:

a transmission;

a push rod assembly which is driven by said transmission;

an end seal compression jaw in driving engagement with said push rod assembly;

compliance means for jaw compliance with a contact member when said jaw is driven into a compression relationship with the contact member.

142. The assembly of claim 141 wherein said compliance means includes a compliance spring.

143. The assembly of claim 142 wherein said push rod assembly comprises a rod and a reception sleeve receiving said rod and said reception sleeve being biased by said compliance spring which is in a reception relationship with said rod.

144. The assembly of claim 143 wherein said rod has a first end received by said jaw with said jaw being compliance adjustable relative to said first end.

145. The assembly of claim 144 wherein said rod further comprises an expanded jaw end which restricts movement of said rod relative to at least one of said jaw and reception sleeve.

146. The assembly of claim 145 wherein said expanded end is received by said jaw.

147. The assembly of claim 141 wherein said transmission means includes a cam.

148. The assembly of claim 147 wherein said transmission means further including a roller which is in engagement with said cam and in driving communication with said push rod assembly.

149. The assembly of claim 148 wherein said roller is positioned at one end of said push rod assembly.

150. The assembly of claim 148 wherein said roller rides along an outer, peripheral edge of said cam.

151. The assembly of claim 148 further comprising a roller bias spring which is positioned so as to bias said roller into engagement with said cam.

152. The assembly of claim 141 wherein said compliance means includes a first and a second spring positioned at said push rod assembly.

153. The assembly of claim 152 wherein said first and second springs have a different spring constant value.

154. The assembly of claim 153 wherein said first spring is positioned to bias said jaw toward the contact member and said second spring is positioned so as to bias said rod toward said transmission, and said first spring is of a higher spring constant than said second spring.

155. The assembly of claim 152 wherein said first spring is positioned to bias said jaw toward the contact member and said second spring is positioned so as to bias said rod toward said transmission.

156. The assembly of claim 141 wherein said compliance means includes a push rod assembly position restrictor device having an interior contact portion for a guided non-axial position retention of said push rod assembly.

157. The assembly of claim 156 wherein said push rod assembly position restrictor device is a casing that is fixed in position relative to a sealer frame structure, and said rod is received within said casing and in communication with said biasing device such that said rod is adjustable relative to said casing.

158. The assembly of claim 157 further comprising a slide sleeve slidingly received within said casing, and wherein said biasing device exerts a biasing force against said slide sleeve.

159. The assembly of claim 158 wherein said compliance means includes a second biasing device positioned between an expanded portion of said rod assembly and said casing.

160. The assembly of claim 141 further comprising a heat element supported by said end seal compression jaw.

161. The assembly of claim 141 further comprising a casing receiving said push rod assembly and wherein said push rod assembly includes a pair of rods in engagement with respective opposite ends of said jaw, and each of said push rods being axially adjustable relative to one of said jaw or a housing receiving said push rod assembly.

162. An end sealer shifting assembly, comprising:

a sealer compression jaw;

a rod assembly in driving engagement with said jaw, and said rod assembly having an adjustable engagement with said jaw;

a cam member in driving engagement with said rod assembly.

163. The assembly of claim 162 further comprising a compliance bias spring, and wherein the driving engagement between said rod assembly and said jaw includes a rod extension slidingly received by said jaw and said jaw being biased away from said cam member by said compliance bias spring.

164. The assembly of claim 163 further comprising a casing which receives said push rod assembly; and a second biasing spring, and wherein said push rod assembly includes a second bias spring contact section, and said second biasing spring being in a biasing relationship between said casing and the second bias spring contact section of said of said push rod assembly.

165. The assembly of claim 163 wherein said jaw comprises a block having a heater wire compression surface and a rod reception component which slidingly receives an end of said rod.

166. The assembly of claim 162 further comprising a housing block and wherein said push rod assembly includes a slide rod, which is slidingly received by said housing block.

167. The assembly of claim 162 further comprising a push rod assembly position restrictor, and wherein said transmission includes a cam, and wherein said push rod assembly includes a first spring which is preloaded to bias said jaw outward relative to the push rod position restrictor, and a second spring which is designed to bias a transmission engagement end of said push rod assembly toward said cam.

168. The assembly of claim 167 wherein said first spring has a higher spring constant than said second spring.

169. A method of manufacturing an end sealer shifter assembly, comprising:

providing a transmission;

providing a push rod assembly which is in driving engagement with said transmission;

providing an end seal compression jaw in driving engagement with said push rod assembly; and

providing compliance means for jaw compliance with a contact member when said jaw is driven into a compression relationship with the contact member.

170. A method of forming an end seal in a bag dispensing system, comprising:

feeding bag material between a first jaw and a second jaw;

providing foam precursor to said bag being formed;

moving a first of said first and second jaws toward an opposite one of said first and second jaws to place in contact with the bag material an end seal element; and

with compliance means, allowing said moving jaw to conform to any variations in relative jaw-to-jaw flush contact when said first and second jaws are placed in an end seal forming relationship.

171. An end seal assembly comprising:

an end seal heater element;

a support for said end seal heater element;

a control system in electrical communication with said heater element and said control system including means for comparing resistance levels at a current temperature and comparing with a TCR based or derived value reference.

172. The end seal assembly of claim 171 wherein said end sealer is a cross-cut wire and there is further provided one or more non-cut, sealing wires adjacent to the cross-cut wire.